



Our

PROPERTY OF
Bureau of Land Management
D S C LIBRARY

OCTOBER 1960

Vol. 10 • No. 2

PUBLIC LANDS

BUREAU OF LAND MANAGEMENT



OUR PUBLIC LANDS . . .



Issued quarterly by
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
Washington 25, D. C.

The printing of this publication has been
approved by the Director of the Bureau
of the Budget, February 25, 1960

DEPARTMENT OF THE INTERIOR
Fred A. Seaton, Secretary
BUREAU OF LAND MANAGEMENT
Edward Woozley, Director

BUREAU OF LAND MANAGEMENT ORGANIZATION	
Director	Edward Woozley
Associate Director	Earl J. Thomas
Assistant Director	Charles P. Mead
Assistant Director	James P. Beirne
Assistant to the Director	Charles R. Drexilius
Assistant to the Director	C. Edward Hoyt
Appeals Officer	Abe H. Furr
Cadastral Engineering Staff Officer	Donald B. Clement
Forestry Staff Officer	Walter H. Horning
Lands Staff Officer	Harold Hochmuth
Minerals Staff Officer	Max Caplan
Range Management Staff Officer	Gerald M. Kerr
International Cooperation Officer	Byron C. Denny
Information Officer	Dwight F. Rettie

AREA ADMINISTRATORS	
Area 1, James F. Doyle	Portland, Oregon
Area 2, Neal D. Nelson	Salt Lake City, Utah
Area 3, Westel B. Wallace	Denver, Colorado
Area 4, Jesse M. Honeywell	Juneau, Alaska

Materials in this publication are not
copyrighted and may be reprinted without
permission. Mention of the source will
be appreciated but is not required.

"Conservation is a state of harmony between men and land. By land is meant all of the things on, over, or in the earth. Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and waste the range; you cannot build the forest and mine the farm. The land is one organism. Its parts, like our own parts, compete with each other and cooperate with each other. The competitions are as much a part of the inner workings as the cooperations. You can regulate them—cautiously—but not abolish them."

(From "Round River—From the Journals of Aldo Leopold," edited by Luna B. Leopold, Oxford University Press, 1953.)

CONTENTS

ARTICLES

CONDITION AND TREND SURVEYS	
Scientific data for sustained yield range management	
by MILO H. DEMING, Range Conservationist, BLM	3
GRAZING A MILE HIGH	
by JIM YOAKUM, Range Conservationist, Ely, Nev., BLM	6
THE JORDAN CRATERS	
by ROBERT R. KINDSCHY, Range Conservationist, Vale, Oreg., BLM	8

FEATURES

ACTIVE ACRES	10
Anti-speculation Rules	
Topographic Index	
Speed Rangeland Rehabilitation	
Revenues to O&C Counties	
Wildlife Refuges	
Guaranteed Payment	
LU Lands Added to Grazing District	
On the Bookshelf	
Orthophotoscope	
EARLY FIRE LOOKOUT	16

COVER

Bluebunch wheatgrass, often called bunchgrass, is one of the most important range plants on the high semi-arid plateaus of southeastern Oregon. It is a desired livestock grass, a good soil stabilizer, and a heavy forage producer. About 40 percent of each plant can be eaten by livestock and wildlife without hurting the plant or preventing new growth. When more than 40 percent of the plant is eaten, the roots are robbed of food produced by the leaves and the plant will be stunted or die.

CONDITION AND TREND SURVEYS

scientific data for sustained yield
range management

by Milo H. Deming, Range Conservationist, BLM



FOR over half a century before 1934, sporadic efforts were made to secure legislation to conserve and control grazing on public lands in the western United States. In June 1934, the passage of the Taylor Grazing Act provided for the protection, development, and improvement of unreserved public range lands under the Department of the Interior by preventing over grazing and soil deterioration, and by stabilization of the livestock industry.

The first grazing districts were established in 1935. Due to reorganization and additions there are now 59 districts with a gross area of about 159 million acres under BLM administration.

In the 5 years from 1955 to 1959, a comprehensive survey of the condition of all ranges in grazing districts was completed. Specially trained range technicians on the staff of each grazing district carried out the field work.

The special standardized training assured reasonable conformity in results of judging range conditions. It also meant that consideration was given to local climate and topography, which vary over the great expanse of range lands in the western United States.

When standard methods are used in surveys repeated in the future, the results can be used for comparisons with past studies to determine trends.

The results of the 1955-59 survey are summarized in the table. This shows the percentages of usable acreage in each condition class on about 152 million acres. About 7 million acres of the gross area are wasteland, unusable for grazing purposes.

The range condition shown in the table is a summary of field work, from data gathered in part

RANGE CONDITIONS AND TRENDS

1955-59

State	Usable range acres	Percent in each range condition class					Trends from 1955 to 1959		
		Excellent	Good	Fair	Poor	Bad	Percent improving	Percent static or indefinite	Percent declining
Arizona.....	12, 492, 991	0. 3	6. 7	36. 0	50. 3	6. 7	37. 1	54. 1	8. 8
California.....	3, 696, 641	1. 0	11. 0	75. 0	12. 0	1. 0	1. 0	72. 0	27. 0
Colorado.....	7, 461, 675	. 0	14. 0	60. 0	23. 0	3. 0	34. 0	55. 0	11. 0
Idaho.....	11, 856, 062	3. 4	19. 5	48. 9	25. 3	2. 9	35. 3	44. 7	20. 0
Montana.....	7, 831, 016	1. 1	55. 0	39. 9	3. 9	. 1	19. 7	69. 6	10. 7
Nevada.....	45, 113, 509	2. 3	11. 0	53. 4	27. 4	5. 9	17. 2	65. 5	17. 3
New Mexico.....	13, 560, 831	. 8	22. 2	62. 9	11. 6	2. 5	29. 0	58. 0	13. 0
Oregon.....	12, 586, 506	. 6	15. 5	48. 3	28. 2	7. 4	24. 7	50. 5	24. 8
Utah.....	23, 072, 694	. 3	4. 3	54. 0	36. 4	5. 2	23. 8	47. 0	30. 2
Wyoming.....	14, 258, 467	4. 0	23. 0	60. 0	11. 0	2. 0	26. 0	54. 0	20. 0
Total weighted average.	151, 930, 392	2. 0	15. 0	52. 0	26. 0	5. 0	24. 0	57. 0	10. 0

from 1955 to 1959. Because of manpower limitation, only a portion of each district is covered each year, but a rotation system of surveys is planned so that part of every district will be resurveyed every 5 years.

Significant changes in local management or administrative practices, improved facilities and installations, and the variation in natural phenomena which affect forage production and its use, cause changes in the range condition.

The cumulative influences most responsible for trends in range conditions are the seasonal and yearly variation in weather and grazing pressure. Consequently, records of actual stocking, big game populations, degrees of utilization of forage, range improvement installations, forage production, and weather must be kept or consulted to determine valid reasons for the changes in conditions disclosed by the surveys.

All vegetation is not equally used or desired by grazing animals. Therefore, it is necessary to classify plants into groups according to their value for each kind of animal, at each season of the year. Certain plants which have no forage value may be valuable as protective cover for watershed and erosion control. Local plant classification lists are prepared to illustrate all significant relationships.

The work of securing essential field survey information is done by several routines of procedures and different intensity of examination of range areas. These methods, in general, seek the same end, but they vary in the preciseness of data which is secured and consequently in exactness of the answers.

One method uses intensive studies of selected

RANGE SURVEY. A BLM range conservationist weighs a grass sample.





EXCELLENT RANGE. This heavy stand of bunchgrass will support herds of livestock and wildlife.



GOOD RANGE. Moderately grazed grass.

sites to determine long-time trends. On these selected key areas (called transects), changes may be measured by comparison of repeated observations about the extent of living plants and litter as ground cover. A transect is established with a steel tape stretched between two permanently located iron stakes. Readings are taken along the tape at stated intervals or the extent of the exact shadow cast by overhanging vegetation can be measured on tape.

After several years, the same transects are re-measured and data is taken from which the differences in bare space or that covered by different kinds of vegetation may be determined. These differences are analyzed to compare the trends in condition either up or down through the intervening years.

A second commonly used method is a random sampling survey with field observations and records made at selected representative locations throughout the range unit area. At each place, itemized records are made of the kind and amount of plants and their vigor and maturity. Each of these four items is rated by a mathematical index with appropriate descriptions which guide the examiner's judgment. In a like manner, four items describing the conditions of the site and soil of each location are rated and recorded. Under certain circumstances more extensive methods of surveys, or estimates are made, or photographs repeated successively are depended upon for periodic comparisons of trends.

The ratings assigned to the forage stands and to soil and site at each location are recorded on a map at the approximate location of each observation station so that re-examination can be made at the same place. These map point locations also aid in determining and drawing the zone boundaries between the classes of range condition. The comparative classes are excellent, good, fair, poor, and bad. From these zoned maps, area acreage computations of each class are made by planimeter or other measuring device.

In examining the range and interpreting signs of what is happening there, certain plants of each association are used as indicators or signals of special significance. The extent to which the ani-

(Continued on page 12)



FAIR RANGE. Too much sagebrush competition.



POOR RANGE. Very little forage.

BAD RANGE. Virtually no grass and the soil is being eroded.



GRAZING A MILE HIGH

by Jim Yoakum, Range Conservationist, Ely, Nevada, BLM

“WHERE rolls the Oregon.” Since the first westward migration across the North American continent these words have implied vastness, freedom, and isolation. Today much of southeastern Oregon is as primitive as when the wagon trains arrived over 100 years ago or when the first vaqueros trailed their cattle in from California and Texas.

Southeastern Oregon is one of the least populated areas of the United States, according to the U.S. Bureau of Census 1950 figures. For many ranch families the closest high school may be a hundred or more miles away. Consequently, school systems maintain boarding homes where students stay to obtain a high school education.

This vast open rangeland is largely under the

administration of the Bureau of Land Management. It is wholly within grazing districts as defined in the Taylor Grazing Act of June 28, 1934.

Should you pass through the country today, you would quickly notice that the area is highly utilized for grazing. Since white men settled in the region, the livestock industry has flourished above all other major businesses. Cattle dominate the range. Sheep and horses comprise only about 10 percent of the total use. The vast herds of wild mustangs and burros so common a couple of decades ago have disappeared.

In the 1920's and early 1930's southeastern Oregon possessed the largest remaining herd of pronghorn antelope in North America. Today a few of these speeders of the plains can still be seen

HEREFORD CATTLE. Grazing along the Owyhee River in southeastern Oregon.



their native habitat. Buffalo, too, roamed these high plateaus, but they have been gone for over a century. The common mule deer have, however, increased to greater numbers than ever before known. Big "mullie" bucks are trophy animals in southeastern Oregon and sportsmen travel from afar to see a once-in-a-lifetime set of antlers.

Soil made through many centuries from lava basalt parent material is rich in organic elements and the native forage plants grow well, provided that Mother Nature is generous with her rainfall. The annual moisture index averages 8 to 12 inches. Years of drought and semidrought are not uncommon, but when rainfall is above normal the region is bursting with wildflowers and the grass is rich enough to fatten every animal on the range.

The elevation of southeastern Oregon averages four to six thousand feet. The weather is extreme; winters are long and cold and summers prolonged and hot.

Possibly the most important item limiting the invasion of civilization in the area is the relative lack of water. The only inhabited areas are along the Malheur, Snake, and Owyhee Rivers which traverse the country like veins of life. Most of the ranches are concentrated along the rivers in reliance for water to irrigate hay meadows which must supply needed forage for winter feeding. Out on the open range there are few springs, and the majority of small streams run only intermittently throughout the year.

The first range animals utilized by man in southeastern Oregon were wild buffalo. Just a few decades ago when the Malheur Lake went dry, old bison bones could again be seen bleaching under the intense summer sun. The first white men with their oxen-pulled wagon trains and herds of cattle and horses passed up southeastern Oregon for the richer agricultural lands in the Pacific coastal valleys. To settlers traveling via the famous Oregon Trail, the high, semiarid lava plateaus were more commonly termed "deserts," lacking in water, abundant with hostile natives, and well remembered for hot, dusty summer months.

In the latter 1800's, gold and silver were discovered along the Oregon-Idaho border. Towns sprouted up where people had sworn they would never live. The mass migration of miners with families into the area created a gigantic problem—food for the many. Small truck farms began to crop up in the lower valleys. At first most of the livestock were trailed in from Texas and California until a few large operators began raising large numbers of cattle and sheep on the public domain. Wild mustangs were abundant, for in summer they could travel far from water in search of grass.

From the mid-19th century to the turn of the 20th, three cattle ranchers became known as "Cattle Kings" in southeastern Oregon. They were Pete French, Dave Shirk, and Henry Miller.



SHEEP CORRALS. Sheep and horses do about 10 percent of the grazing.

These men ran thousands of cattle on the public range. Pete French ran the family "P" Ranch in the Blitzen Valley, and his experiences are well recorded in Elizabeth Lambert's book *Pete French—Cattle King*.

Dave Shirk homesteaded a ranch along Home Creek in Catlow Valley. He has recorded his early-day experiences in his autobiography entitled *The Cattle Drives of Dave Shirk*. Dave Shirk's account of how livestock had sufficient native grasses for year-round grazing is of special interest to range managers today. In the winter the grass was high and plentiful enough to be eaten above the snow. As years went by the grasses became less plentiful, and within Shirk's lifetime it became necessary to put up hay in order to winter over cattle.

Located in the southern portion of Malheur County is the Whitehorse Ranch. This was one of the many ranches owned by the Miller Hux Syndicate during the 19th century. A book entitled *The Cattle King* records some of the vivid memories deeded to history by Miller.

The livestock business in southeastern Oregon is quite different now than it was in the 19th century. Hundreds of small ranches have replaced the cattle empires. For example, in Malheur County today, approximately 500 licensed ranchers run livestock on public domain grazing lands.

(Continued on page 14)

SURVEY PLOT. A BLM range survey crew collects scientific data to determine range conditions.



by Robert R. Kindschy, Range Care



SPATTER CONES formed along a fault in the earth's surface.

A QUICK glance at the numerous functions of the Bureau of Land Management provides a clue to the vast potential of our public lands. Certainly mineral, timber, and livestock forage production have long been recognized. More recently the value of public lands for wildlife habitat and recreational pursuits has come into focus. In addition, occasionally areas are of particular interest from a scientific point of view.

The Jordan Craters lava flow in the remote upland desert of southeastern Oregon is such an area. Due to the lack of suitable access roads and the inhospitable character of the surrounding sagebrush-covered desert, this fascinating geological

THE JORDAN CRATER was principally

SEA OF LAVA. The light patch in the distance is a kipouka or land island.



CRATERS

otianist, Vale, Oregon, BLM

formation is seldom visited.

However, once adventurous travelers have braved the 30 miles of gravel and dirt roads, they invariably discover the trip worthwhile. The awesome panorama of over 17,360 acres (27 square miles) of basaltic lava is a thrill to be remembered a lifetime.

Southeastern Oregon has a long history of volcanic activity. Much of the lava rock in evidence today was extruded during the Miocene Period, some 15 million years ago. Extrusions have slowly dwindled in frequency over most of the area. The Jordan Valley region is an exception, for here lava has welled up through cracks or faults

in the earth's crust to form at least four recent flows. The Jordan Crater flow is believed to be the most recent.

Geologists are not in complete agreement as to when the Jordan Crater flow occurred, but many believe it happened about 400 or 500 years ago. Geologically speaking, this is scarcely yesterday. The arid climate of southeastern Oregon has greatly hindered the establishment of plant life. For the botanist this lava flow is a paradise for the study of primary plant succession.

Apparently the lava flow started on the east slope of a ridge where pressure beneath the earth's crust found a weakness or fault. Violent explosions threw tons of molten rock into the air. As the flow of liquid basalt increased, it spilled down the ridge into a large basin. It appears as though the basin was rapidly filled, for molten lava flowed some distance up entering valleys, much as a lake forms behind a dam.

A large crater developed as the lava spewed out of the fault. As the underground reservoir of lava diminished, vast quantities of cinders and volcanic bombs were blown out. A larger cinder cone is situated on the southern lip of the crater as evidence to this holocaust.

Sometime during the eruption, the crater vent probably became plugged and the subterranean pressures sought new openings along the fault. Seven small spatter cones or miniature volcanoes developed higher on the ridge, all in a straight line along the fault.

The flow has all the features desired by the igneous geologist. After the surface lava had cooled into solid rock, the underlying, still molten lava flowed on leaving large caves and broken-edged sink holes. Much of the flow is composed of smooth "pahoehoe" lava. Ripple marks, gutters, pressure ridges, and lava cascades are frozen into the surface, just as they were when the basalt first cooled. A few areas of the flow are dominated by the rough type "aa" lava. Here solidified lava was warped and broken under renewed pressure. This created a jumble much like a pile of furnace clinkers.

Two hills were almost inundated by the Jordan Crater flow. Only their tops protrude above the flow, like islands upon a sea of lava. These islands, geologically referred to as kipoukas, are of interest to the botanist, for on them grows vegetation undisturbed by man and his livestock.

At one end of the flow there are a complex series of permanent ponds. These are probably the result of the water table being raised when the drainage basin was filled with lava. The ponds are an important breeding and resting site for ducks, geese, and other waterfowl.

You may wish to visit this land of creation and experience a firsthand look at the earth as much of it must have appeared 15 or 20 million years ago. If you do, you can obtain maps and additional information from the BLM office at Vale, Oregon.

End

source over 27 miles of lava flow.





ANTI-SPECULATION RULES

Stringent public interest safeguards against public land speculators are embodied in regulations proposed by the Secretary of the Interior. The rules apply to Federal private land exchanges.

The regulations would spell out Interior's anti-speculation policy which safeguards against speculative use of exchanges between the Federal Government and private land owners.

The rules cover four requirements.

1. People seeking Government-private land exchanges must actually own and furnish proof of title to lands they offer for exchange. It had formerly been possible for people to make exchanges on the basis of options and purchase agreements.

2. An applicant must prove that the land he is seeking is a necessary and integral part of the economic unit which includes land he already owns.

3. If the lands selected involve less than 1,000 acres, or \$10,000 in value, the applicant must furnish a notarized statement of two qualified people showing their opinions on the fair market values of both the offered and selected lands. Exchanges involving more than 1,000 acres or \$10,000 in value will require two formal land appraisals by reputable, competent appraisers.

4. People seeking land exchanges must furnish a statement giving complete details about any arrangements they may have made, either before or after they file their application, to sell or otherwise dispose of all or part of the lands they are seeking to acquire.

The new regulations would not impede private exchanges for their basic purpose of simplifying land ownership patterns.

TOPOGRAPHIC INDEX

A new index map of the United States has been published by the Geological Survey covering small-scale maps in the 1:250,000 scale topographic map series.

When completed, this series covering all 50 States will contain 626 maps, 437 of which are now available. Five show the eight principal islands in Hawaii. Alaska is covered by 153. Ninety-five have been completed during the past 15 months and 32 are in progress. All are expected to be available by late 1962 or early 1963.

Copies of the newly revised index showing the area covered by each map can be obtained free upon request, from the Map Information Office, Geological Survey, Washington 25, D.C.

SPEED RANGELAND REHABILITATION

New rules will speed up efforts to restore and rehabilitate run-down public rangelands. Orderly

schedules for range use adjustments will replace time-consuming appeals.

Adjustments in the number of livestock licensed to use the range are necessary when a range survey or range trend study indicates the range is over-obligated and deteriorating. Licensed use must then be reduced to the level the available forage will support.

The new amendments to the Federal Range Code for Grazing Districts will permit BLM to spread grazing adjustments of 15 percent or more over 2 or 3 years in special cases.

Of course, the new rules do not affect BLM's assigned responsibility to carry forward its range programs on an immediate, across-the-board basis when circumstances demand fast action. BLM range managers may, in cases of emergency, put any range use adjustments in full force at any time.

The new regulations will permit BLM and the range users to begin the job of rehabilitating the range immediately and at the same time the affected users could acquire additional sources of forage, make any necessary livestock disposals, or complete other financial or operational adjustments.

REVENUES TO O&C COUNTIES

Revenues to the 18 counties in western Oregon entitled to share in receipts from timber sold during the last fiscal year on the Oregon and California Railroad grant lands reached a new all-time high of \$24,387,868.06. This represents 75 percent of gross revenues from timber sales of \$32,517,157.41.

Treasury checks totaling \$16,258,578.71 are being delivered by BLM. Total payments to the counties are up more than \$1.4 million over a year ago.

WILDLIFE REFUGES

National Wildlife Refuges administered by the Bureau of Sport Fisheries and Wildlife attracted a record-breaking total of almost 10 million visitors in 1959.

The 1959 total of 9,936,000 visitors represents an increase of 882,000 over 1958 and set a new public-use record for the ninth consecutive year. In 1951, when visitor records were started, only 3½ million persons found their way onto refuge areas.

Visitors to the refuges are attracted by such recreational activities as sport fishing, hunting, picnicking, swimming, boating, bird watching, and picture-taking. Very few areas have conditions suitable for camping.

GUARANTEED PAYMENT

New Federal oil lease regulations will require that simultaneous offers for oil and gas leases be accompanied by guaranteed negotiable remittances, covering advance lease rentals, not merely checks which might be drawn against insufficient bank deposits.

Only cash, money orders, certified checks, bank drafts or bank cashier's checks will be acceptable to cover advance rentals. Filing fees will still be payable by uncertified or personal check. The present regulations simply require that offers be accompanied by "separate checks."

Under the present system an unscrupulous person could file numerous offers accompanied by checks drawn against insufficient funds.

The new regulations were proposed and published, following which the public had 30 days to submit any comments or opinions. The Department received 25 letters, 12 of which favored the regulations as originally proposed and 13 of which opposed the proposal or suggested various changes.

As result of the comments received the Department has relaxed one certified check requirement; as first proposed the rules would have required guaranteed payments covering both the \$10 filing fee and the advance rental. The final regulations will not change the uncertified check method of payment of the filing fee.

LU LANDS ADDED TO GRAZING DISTRICTS

The Secretary of the Interior has ordered the consolidation of 2 million acres of former land utilization project (LU) lands in Montana and New Mexico grazing districts.

The lands were transferred to the Department of the Interior from the Department of Agriculture by the President in 1958.

The LU lands will be incorporated into the general administration of grazing district lands. Approximately 1,806,740 acres will be consolidated with Montana grazing districts 1, 2, 3, and 6; 239,003 acres will be added to New Mexico grazing districts 1 and 6.

Grazing fees will remain the same as charged under Department of Agriculture administration. The distribution of receipts also remains unchanged, with 25 percent being paid to the counties in which the lands are located.

BLM obtained special authority to designate an additional 25 percent of revenues for range improvements.

The LU lands were part of several million acres purchased by the Federal Government during the 1930's under terms of the Bankhead-Jones Farm Tenant Act.

(Continued on page 15)

CONDITION AND TREND SURVEYS

(Continued from page 5)

imals are using the most favored plants, or the substantial but less choice food plants, or those which are least desirable as forage is indicative of the amount of grazing pressure on the range.

In the procedures developed for studying range by these different survey methods, certain factors of the forage stand are particularly noted and mathematical ratings are assigned as a guide to the examiner's judgment.

The four factors which refer to forage relationships are:

1. *The quality of the plants*, forage value, and placing in stages of plant succession.

2. *The quantity of plants*, the relative abundance and density of desirable forage plants appearing in the stand.

3. *The vigor of the plants*, the relative health of desirable plants which affects their capacity to produce leafage and seed stalks, and to recover from defoliation by grazing.

4. *Reproduction*, the ability to maintain a satisfactory stand over a period of years through replacement of their own kind.

The factors of site and soil which are chosen for mathematical ratings are:

1. *The protective cover*, or the canopy of vegetation and litter which shields the ground surface from the action of wind and water.

2. *Natural vulnerability*, the physiographic features, weather and topography which may influence the stability of soil or the rate of water runoff.

3. *Runoff resistance*, the ability of the plant cover to absorb water and reduce runoff.

4. *Soil stability*, the relative rate at which soil is moved by erosion or its ability to remain in place.

Besides grazing, there are many other responsibilities and functions which are part of conservation of rangelands. That is why BLM seeks a comprehensive picture of the range and watershed complex.

Range condition surveys serve several purposes.

They periodically assess the progress made in range management.

Range surveys establish reliable performance tests as guides for adjustment action by local district range managers.

They also provide a uniform system of permanent records which would develop a correlated history of grazing use, weather influence, and forage production, so that periodically these may be analyzed and the combined results assessed.

Range surveys establish uniform principles for judging the changes occurring under current management practices so that when men are transferred there are reliable and systematic records of precedent action and cumulative results.

Range condition surveys show the location and specific needs for range improvement facilities

to assist in the distribution of regulated use, or to establish the places and possibilities for such rehabilitation practices as seeding of the range where natural reproduction possibilities are doubtful or lacking.

Range condition surveys also answer questions about the existing local situations in cases of appeals, in allotment adjustments, and other differences of opinion concerning the effect of range management on individual permittee operations.

Range condition surveys are one of the tools for determining program needs and budgetary requirements when appropriations are being considered in the Department of the Interior, the Bureau of the Budget and the Congress.

When grazing districts were first established, there was little exact information available about the public lands. There were only meager and generalized records of the area, land ownership status, grazing capacity, improvement installations and local range condition. Advisory board members often could furnish some pertinent general information about certain localities, but usually this was limited to the livestock operations conducted there. Some men knew certain parts of the range intimately, but there were great stretches of country about which was little known. On the whole, western ranges were known to be at a low stage of forage production.

For many years, there had been indiscriminate, irresponsible, and competitive use which, coupled with subnormal precipitation, had a marked effect in diminishing forage production. The situation was so critical in 1933 and 1934 that drastic measures were taken to dispose of livestock through government emergency drought relief programs. In 1934 nearly 2 million cattle and more than 2 million sheep were in danger of starving on the ranges of the Western States.

The establishment of regulated use of ranges brought about many changes, some were anticipated and some were incidental developments. Due to differences in the stages of deterioration existing in different localities, fluctuating weather influences, and variable management or livestock operational practices progress toward range betterment has not been uniform.

In order to improve forage and watershed conditions certain adjustments have been made in range management practices. These include allocation of use in allotments with curbs upon unseasonal use and livestock numbers. Many improvement installations such as fences, trails, and water developments have been developed along with the rehabilitation practices of seeding, spraying, and noxious plant removal.

Climate and topography in the 59 grazing districts vary from arid deserts near sea level to humid high mountain areas as much as 13,000 feet above sea level. These different situations require detailed information to insure appropriate management. Part of this is secured by range surveys.

but for the most part information must be obtained by local district staff members. Such information was not always uniformly documented. Until 1955, no standard system for judging the condition of the range existed.

An evaluation of the progress made in range management by BLM in the 25 years since the establishment of the first grazing districts can only be made broadly. Differences in range condition tell only one part of the story. Differences in livestock operations also reflect changes and stages of progress.

Direct comparison of the present situation with conditions which prevailed locally when each grazing district was organized is seldom possible. There is an unfortunate lack of detailed historical records, no uniform descriptive terms, and few historical photographs. However, some overall comparisons may be made with the results of an extensive survey conducted shortly before the Taylor Grazing Act was enacted. This study, published in 1936 as Senate document No. 199, 74th Congress, is entitled *The Western Range*.

This publication reports range depletion and trends in forage production on 127,792,000 acres of public domain lands, including the 61 million acres within grazing districts established by 1936. It excludes about 23 million acres of minor reservations existing on the public lands at the time. The report states:

"The Federal public domain, a no-man's land without management prior to the creation of the grazing districts, is in the worst condition with depletion of 67 percent." (Average.)

With reference to range and watershed impairment, this is said:

"More than 95 percent of the available range on the public domain grazing districts and other reservations is eroded, one-half materially and one-half severely; nearly 45 percent of the area is contributing silt to important streams."

This comment is made about trends in range condition:

"Whether range conditions are on the up or downgrade may be even more significant than the extent of present depletion. Here also the public domain has the blackest record, with nearly 95 percent of the total area depreciating during the last 30 years, and only 2 percent improving. . . . Putting it another way, 50 years effort may be necessary to build the range up to the point where it can carry safely, the livestock now being grazed."

In contrasting the situation which is disclosed by the most recent survey of range condition with that reported in *The Western Range*, somewhat different criteria and terms were used to express similar meaning. There is also a difference in the acreages concerned, so that percentage of area offer a better comparison. The 1955-59 survey covered about 152 million acres, including about 3 million acres formerly in withdrawals and



HALOGETON. A poisonous range plant.

minor reservations which were not covered in the survey of 1930-35.

In the 1930-35 survey of about 128 million acres of public domain the condition of the range was expressed in terms of four classes of range forage depletion as follows:

Moderately depleted: 1,868,000 acres or 1.5 percent.
Materially depleted: 18,320,000 acres or 14.3 percent.
Severely depleted: 61,168,000 acres or 47.9 percent.
Extremely depleted: 46,000,000 acres or 36.6 percent.

With reference to soil mantle as well as to forage stand, the 1955-59 survey expresses range condition in five classes as follows:

Excellent condition: 2,453,879 acres or 2 percent.
Good condition: 23,042,715 acres or 15 percent.
Fair condition: 80,376,994 acres or 52 percent.
Poor condition: 39,230,855 acres or 26 percent.
Bad condition: 6,825,949 acres or 5 percent.

In a similar manner the trends in range condition reported in both surveys are compared. For the 1930-35 survey data for about 128 million acres show the trends in forage production at that time were as follows:

Appreciable improvement: 1,255,000 acres or 1 percent.
More or less unchanged: 7,864,000 acres or 6 percent.
Appreciable decline: 118,673,000 acres or 93 percent.

With similar meaning but with consideration of the soil mantle and site condition included, the expression of the trends in range condition disclosed by the 1955-59 survey of about 152 million acres is as follows:

Improving: 36,539,617 acres or 24 percent.
Indefinite or static: 86,632,492 acres or 57 percent.
Declining: 28,758,283 acres or 19 percent.

The most significant accomplishment in management under the Taylor Grazing Act is the slowing down and reversing of the high percentage of downward trend in condition that was present in 1935. About half of the area then declining has now reached a static or median stage, while about one-fourth of the then declining area has definitely improved. These comparisons of results over the past 25 years strongly emphasize the fact that rehabilitation of deteriorated range is a long, slow moving and often erratic process. This is especially true when the ranges must carry some grazing during the period of recovery.

End



GRAZING A MILE HIGH

(Continued from page 7)

A large amount of grazing land is still unfenced, upon which ranchers run livestock in common; however, more and more operators are beginning to see the advantages of intensified range management through individual allotments.

In Oregon, livestock are allowed to graze on the public domain for 7 months a year, generally from April to the end of October. The 5 remaining months are a rest period, at which time livestock are retained on private ranch properties. Certain areas have been designated as winter use ranges, but they are few and generally restricted to desert regions.

A sign of change in public grazing administration by local ranchers that would raise the eyebrows of old cattle barons, is the current trend toward livestock associations. These are established in the following manner. Range users running livestock in a given unit meet and draw up a constitution. This is, in turn, presented to the Bureau of Land Management for recognition and approval. When accepted, the association then elects its officers and maintains certain responsibilities such as salting, determining bull-cow ratios, inspecting ranges for turn-out dates, and assessing members for range improvements. The system has done wonders to advance range management in grazing districts.

Improving grazing lands has been a major BLM conservation and management practice during the past couple of decades. Depleted ranges have been cleared of sagebrush and successfully planted with grasses; springs have been developed and reservoirs dug for water developments; roads constructed and fences built—all with the main objective of improving range management practices. These, in turn, produce higher grazing capacities which yield greater livestock monetary returns.

One of the most outstanding examples of range improvement is the vegetation rehabilitation program. Some of southeastern Oregon's better native bluebush wheatgrass and Idaho fescue ranges are rated 5 acres or less per animal unit month (AUM). Very often though, adjacent depleted ranges may require 15 to 20 acres per AUM. Many of these deteriorated areas are being improved by a number of land treatment methods. In areas having remnants of desirable perennial grass

DISCING. Discing is one of the methods of killing mature sagebrush.

species along with stands of sagebrush, chemical control of the undesirable brush by aerial spraying has proven successful. Gains in herbage yield to 800 pounds and above per acre over a 2-year period have been obtained as a result of chemical brush control. Grazing to the extent of 50 percent of total production with such yields equals about 1 ton of forage per 5 acres of range. This increase is the result of an investment of about \$3 per acre, or \$15 for the 5 acres.

Where there are insufficient remnants of perennial forage species remaining, mechanical treatment of the lands has been found desirable. The most common method is plowing followed by seedling. The brushland plow will usually kill 70 to 90 percent of the brush; following with a double disc on good soils will usually account for a 95 to 100 percent kill on mature sagebrush stands.

On semiarid ranges in the 7- to 12-inch precipitation belt, crested wheatgrass has been the only sure producer. Grazing alfalfas have been used in mixture with wheatgrass. Pubescent, Whitmar beardless, tall and Siberian wheatgrasses have been sown in localized areas.

Plowing with a D-7 or TD18 tractor and two brushland plows taking a 17-foot swath is being accomplished for approximately \$2 per acre; double discing costs \$1.50 per acre. Add 50 cents an acre for other related costs and the total cost per acre for mechanical brush removal amounts about \$4. Additional land treatment costs involve crested wheatgrass seed at 40 cents a pound. It is sown at the rate of 5 pounds to the acre. Seed drilling costs \$1 an acre. Protective fencing will entail additional costs.

Most of the lands treated in this manner had almost no former forage productive value; a few had been rated as good as 20 acres per animal unit month. Some of the present better crested wheatgrass seedlings have been used as heavily as 1/2 to 1 1/2 acres per AUM. The average is probably about 3 to 5 acres per AUM. The economic benefits of this improvement practice are quite clear—the net results are an increase in grazing capacity of 4 to 20 times.

In addition to improving the grazing vegetation, BLM's soil and moisture conservation program works toward water development and prevention of soil erosion. Wells have been drilled, windmills erected, and springs developed for better water and livestock distribution. To check severe gully erosion, hundreds of detention dams and silt reservoirs have been constructed. These earthen structures serve dual objectives by providing waterholes for livestock and by checking excessive water run-off caused by summer thunderstorms.

It is conjectured that in the past, more Indians lived in the southeastern region of Oregon than



FEDERAL RANGE. Balanced grazing stabilizes the livestock industry and insures continued meat production.

do white men today. These native Americans relied greatly for subsistence on such grazing animals as buffalo, antelope, bighorn sheep, and mule deer.

Now the region looks very much like it did in pristine times except for the scattering of intermittent small ranches. Livestockmen raise cattle and, to a lesser degree, sheep. The greater percentage of livestock grazing is conducted on public range administered by the Bureau of Land Management.

This area of semiarid lava plateaus has been and still is a region of grazing for its highest use. Consequently BLM stresses improved range management practices with an ultimate goal of providing increased range-carrying capacities for livestock and wildlife. **End**

ACTIVE ACRES

(Continued from page 11)

ON THE BOOKSHELF

Natural Resource Use in Our Economy. Revised edition by William H. Stead, with *Study and Teaching Aids* by George L. Ferish, Director, Conservation and Resource-Use Education Project. (New York, Joint Council on Economic Educa-

tion, 1960). Written in clear, nontechnical language, this book covers the broad nature of resource problems in the United States. Renewable, nonrenewable, energy and human resources are explored. It is invaluable as a background book and guide for the teacher of any grade level and as a text for high school students.

ORTHOPHOTOSCOPE

A new instrument—the universal orthophotoscope, a photogrammetric machine that “flattens the mountains,” has been exhibited by the Geological Survey.

In the new instrument, advantage is taken of the stereophotogrammetric principle to produce photographs that are free from image displacement due to camera tilt or topographic relief. The instrument represents the culmination of nearly a decade of research and development in the field of uniform-scale photography.

In the new model of the orthophotoscope, two overlapping aerial photographs are projected to form a 3-dimensional image on a moving screen. The moving screen has a small slit in its center, and the light that passes through the slit strikes a photographic film.

U.S. GOVERNMENT PRINTING OFFICE: 1960 O—561390

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. • Price 15 cents (single copy)
Subscription price 60 cents a year, 25 cents additional for foreign mailing.

SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON 25, D.C.

OFFICIAL BUSINESS

PENALTY FOR PRIVATE USE TO AVOID
PAYMENT OF POSTAGE, \$300
(GPO)



EARLY FIRE LOOKOUT on Peavine Mountain in Josephine County, Oregon.